To meet this demand, a thermostat was devised, of which a description will shortly appear in the *Journal of Physical Chemistry*. The regulator of this instrument functionates so perfectly that the temperature can be kept continuously at the same thousandth of a degree for hours at a time. It is so constructed moreover as to be capable of adjustment, within one or two hundredths of a degree, to any desired temperature over a range of about fifty degrees.

The most important factors which make such fineness of regulation possible are the following:

1. An extremely efficient circulation in the bath, which eliminates all local differences of temperature large enough to be readable.

2. Such a construction of the regulator that the expansive medium feels each minutest change of temperature and reacts promptly to it.

3. Provision for supplying the bath at all times with just the amount of heat needed, and no more. The regulation does not consist in alternately admitting and shutting off the inflow of heat, but in a 'throttling' of the same.

The extreme accuracy of function mentioned above is naturally obtained only when the thermostat is shielded from sudden changes of radiation. But excellent results are possible without such protection. Without the use of any insulation whatever, the bath can be held at a temperature of thirty or forty degrees within a hundredth of a degree.

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SCIENTIFIC NOMENCLATURE.

TO THE EDITOR OF SCIENCE: In SCIENCE for March 21, I find an article on 'Scientific Nomenclature,' by Mr. Frank W. Very, which concludes with the following words:

> Scientific descriptions remain unintelligible to the lazy man who hates to use the dictionary. They are free property to all who are willing to take this trouble.

On other pages of SCIENCE for March 21 (pp. 458 and 459), I find the words 'ecology' and 'ecological.' As I had never seen them before, I said to myself: 'Here is my chance to vindicate Mr. Very's judicious hint about the lazy man and the dictionary.' So I turned to the Century dictionary, but did not find ecology or ecological. I next had recourse to the new English dictionary of Murray, without success, and then to the new edition of Webster, published the present year. None of these contain the words above mentioned. Recourse to Liddell & Scott's Greek lexicon was equally unavailing. I am moved, therefore, to ask you for an explanation of this new term.

HORACE WHITE.

NEW YORK,
March 22, 1902.

[Ecology has doubtless been coined from the same word as economics, being the branch of zoology or botany that is concerned with the dwelling place or distribution of animals or plants. It will probably come as a shock to biologists to learn that this word is not to be found in recent dictionaries, as it is used in elementary books and courses. The word appears to be post-Darwinian; perhaps some reader can tell us when and where it was first used.—EDITOR.]

BOTANICAL NOTES.

A POPULAR BOOK ON TREES.

WHATEVER tends to popularize a knowledge of our trees is to be commended. Any book which induces a considerable number of people to give more attention to the structure and habits of trees deserves our hearty approval. It is true that too often these popular books are so full of blunders that the scientific man is constantly irritated as he runs over the pages, and as a consequence he is too often unable to see the great body of valuable matter hidden beneath the superficial errors. We have had within the last year or two a number of useful books dealing with plants of various kinds from mushrooms and ferns to wild flowering herbs, shrubs and trees. Now, another book is brought out by Knight and Millet, of Boston, under the title of 'Studies of Trees in Winter,' by Annie Oakes Huntington, with an introduction by Professor Sargent. The fact that so eminent a botanist

has thought it worth his while to write an introduction to the book at once bespeaks our good opinion. A glance at the pages is sufficient to show that in this we are not mistaken. There is, first, a short chapter giving such information as is necessary in the study of the tree in winter, followed by fourteen chapters on groups of trees, as 'The Horse-chestnut' (including also the Ohio buckeye), 'The Maples' (including seven species), 'The Ashes' (four species), 'The Walnuts and Hickories' (six species), etc. The illustrations are exquisite, consisting of 'half-tone' reproductions of characteristic photographs. The colored plates are especially fine, that of a cross-section of an oak trunk being really so perfect that one must run his hand over the plate to convince himself that it is not an actual section of the wood. While the book is printed and bound in a style quite too elegant for a text-book for schools, the subject matter is well adapted for such usage. A less expensive edition for schools should be brought out by the publishers, and in such form it should have wide use in the public schools.

GATTINGER'S FLORA OF TENNESSEE.

It speaks well for a state when its legislature authorizes the publication of a book on technical botany. This was done a little less than a year ago by the legislature of Tennessee in 'an act for the acceptance by the state of a work on botany prepared by Dr. A. Gattinger, and to make an appropriation for its publication and distribution.' The result is before us in the form of a neatly printed book of nearly three hundred pages. That the pages are marred by too many typographical slips is not the fault of the generous-minded men who made provision for its publication, nor of the venerable author, but of the inexperienced printer, to whom much of what he put into type must have been quite unintelligible. The book opens with about twenty pages of prefatory matter, in part historical; the remainder is devoted to a discussion of regional distribution of plants, and this is followed by about 160 pages devoted to an annotated list of the Pteridophyta and Spermatophyta of the state. Following this are about a hundred pages, entitled, the 'Philosophy of Botany,' including several papers of very unequal value. In the list of plants the modern system, as well as the modern nomenclature, is used, the latter being none other than that of the so-called 'Rochester Rules,' which he says he 'reluctantly adopted' after careful deliberation. This useful list is, therefore, another contribution to the more general use of the names recommended by the 'Rochester School' of systematic botanists, and is a sign of no small significance of the inevitable trend of botanical opinion and practice in this country.

The species noted are 2,218, of which 224 are Compositæ; 81, Labiatæ; 52, Umbelliferæ; 172, Malvaceæ; 251, Euphorbiaceæ; 103, Papilionaceæ; 83, Rosaceæ; 57, Cruciferæ; 61, Moraceæ; 124, Cyperaceæ; 223, Gramineæ; 15, Coniferæ; 61, Pteridophyta.

ENGLER'S PFLANZENREICH.

Heften 7 and 8 of this work have appeared within the past few weeks. Number 7 is devoted to the little group of water plants known as the Naiads (Naiadaceæ), and is from the hand of A. B. Rendle, of the British Museum. We have in this number a promise of what we may look for in the future, since this one has the general discussion in English, instead of in German, as has been the rule heretofore. It is quite novel to have a 'part' of a book in which three languages are used, the technical parts being in Latin, as usual, while some of the notes under the species are in German. In this paper the author restricts the family to the genus *Naias,* in which he recognizes thirty-two species. Number 8 takes up the maples (Aceraceæ), and the work is done by Dr. Ferdinand Pax, of the University of Breslau. Two genera are recognized, *Dipteronia,* a monotypic Chinese genus, and *Acer,* the maples proper. The latter genus is divided into thirteen sections, and all told, 113 species are described. In accordance with the latest conceptions of generic lines the box-elders (*Negundo*) are included in *Acer.* It is interesting to note that Dr. Pax has adopted *A. saccharnum* L. as the name of the silver maple (instead of *A. dasycarpum* Ehrh.) and *A. sac-*

charum Marshall for the sugar maple (not *A. saccharinum* Wang). In both numbers the illustrations are of the high order of the preceding *Heften*.

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NOTES ON INORGANIC CHEMISTRY.

THE first two numbers of the *Zeitschrift für Electrochemie* for January contain an experimental investigation by F. Haber and R. Geipert on the preparation of aluminum. The authors used as a crucible a block of coal 245×245×175 mm., the opening having a diameter of 113 mm. at the bottom, 138 mm. at the top, and 70 mm. deep. This crucible served as a kathode, and a rod of coal 66 mm. in diameter as anode. The bath consisted of an artificial cryolite containing somewhat less than the theoretical amount of sodium fluorid, and in this pure alumina was dissolved. The most favorable current was 3 ampères per square centimeter at 7 to 10 volts. Under these conditions the electrolysis proceeded as smoothly and regularly as in the ordinary electro-analytical precipitation of a metal. Although the density of the solid bath is slightly greater than that of aluminum, when fused it is slightly lower. If, however, too much alumina is dissolved in the bath, it becomes too dense and the aluminum, instead of sinking, floats, often short-circuiting the current. A higher percentage of aluminum fluorid than is present in natural cryolite is advantageous, as it renders the bath more fusible. The output varied from 50 to 55 per cent. of that theoretically required by the current. The aluminum prepared was of particularly pure quality, and in the opinion of the authors the production of the same quality on a large scale is possible by the use of pure materials and an anode low in ash. It was found necessary to add fluorid to the bath from time to time to replace that which is lost by a gradual volatilization.

The modern manufacture of tin foil is described by Rafael Granja in the *Journal* of the Society of Chemical Industry. Three varieties of tin foil are on the market: pure tin foil, composition foil, and Dutch leaf. The composition foil consists of lead, covered on both sides with a thin coating of tin, while the Dutch leaf is prepared from an alloy of tin with a few per cent. of a secret metallic composition. The grade of fineness of the foil is expressed by the number of square inches which a pound of the foil will cover. Thus the limit reached by the thinnest pure tin foil is 10,000, by composition foil 7,000, while Dutch leaf reaches 14,000 square inches. The manufacture of the foil, and also of the capsules for the tops of bottles, is fully described in the paper.

FROM the Physiological Laboratory of the Veterinary High School of Vienna comes a contribution, which indirectly contributes to our knowledge of the occurrence of iodin in soils, and especially with reference to the question as to whether it is largely confined to those soils which are near the sea. On examining the thyroid glands of sheep from different Hungarian localities, Wohlmuth finds that the percentage of iodothyrin—0.2–0.35 per cent.—is approximately the same as that found by Baumann in German and French sheep, and that the iodothyrin contains about the same amount of iodin—3.2–3.3 per cent.—as that obtained by Baumann. The sheep from these far-inland localities must therefore have found in their food the necessary quantity of iodin for a normal amount of normal iodothyrin.

THE work of Liversidge on the crystalline structure of metallic nuggets has already been noticed in these columns. This work has been continued by the examination of a number of new specimens. The structure is studied by etching a polished surface of the metal. In nuggets from Lake Superior containing both silver and copper, it appears that the silver has been deposited upon the copper. Gold nuggets from the Klondyke present a structure and appearance quite different from those of any other locality. They are very pale in color, owing to the large quantity of silver present. An assay of two specimens gave only sixty-five per cent. of gold. In the case of silver and copper nuggets, as has been found with those of gold and platinum, there is every indication that the metal has been deposited